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The Issue

What is electronic waste?

Electronic waste, also known as e-waste, is a term that is used to cover all types of electronic and electrical equipment that could enter the waste stream. Electronic waste can originate from a variety of electronic products, including gadgets and appliances such as computers, handphones, televisions, hairdryers and refrigerators.

E-waste is the fastest growing municipal waste stream in America (United States Environmental Protection Agency (EPA), 2012) and in 2008, 3.16 million tons of electronic waste was generated in the U.S. alone ("Facts and Figures," 2010). Its growth is explained due to the rapid developments in technology, where the latest models of gadgets are often replaced at swift rates. As such the ease of access to these models and amazing speed at which they are produced results in a great demand for them. This results in a high replacement rate for technology, contributing to the electronic waste landfills present throughout the world.

Environmental problems caused by electronic waste

Rapid changes in technology, changes in media (tapes, software, MP3) and falling prices have resulted in a fast-growing surplus of electronic waste around the globe. An estimated 50 million tons of e-waste is discarded each year. Most of this waste often ends up in landfills, or transported to less-economically developed countries, such as Ghana, in Africa and Afghanistan, where the precious metals are extracted through a slew of unsafe, unapproved methods that often endanger people's lives and health. Cities, such as Guiyu, China, become known international dumping grounds for electronic waste. In fact, a lot of electronic waste ends up in China, despite having banned e-waste imports.

The improper disposal and burning of e-waste also results in various environmental problems. For example, the burning of computer wires results in hydrocarbons being released into the atmosphere, which results in global warming. In addition to that, acid baths and de-soldering of components such as circuit boards and computer chips results in hazardous substances, such as lead, cadmium and mercury to be released into the air, and sometimes, even seeping into groundwater, poisoning it.

In addition to that, only 12.5 percent of e-waste is currently being recycled. This is a waste because for every 1 million cell phones that are recycled, 35,274 pounds of copper, 772 pounds of silver, 75 pounds of gold, and 33 pounds of palladium can be recovered. However, recycling e-waste is often not easy, due to the presence of compound materials in said waste. Cathode ray tubes (CRTs) are often considered one of the hardest types to recycle. CRTs are often found in television and handphone displays. As a result, it is one of the most commonly found components of e-waste. Thus, improper disposal is extremely dangerous due to the presence of high levels of lead and phosphors in CRTs, both of which lead to a slew of health problems.

Health problems caused by electronic waste

These products are generally made from compound materials and often contain many precious metals, such as gold and silver. However, these products also contain many hazardous materials, such as lead and mercury. E-waste also puts a greater strain on the world's landfills. However, more importantly, the toxic substances present in the waste, often leech into the water and air, causing a torrent of health problems. For example, mercury, which is commonly found in LCD backlighting, switches, and circuit boards, is known to cause birth defects and heart problems. Similarly, cadmium, which is found in batteries, printed circuit boards, and some plastics, is considered among the most hazardous chemicals by the EPA. It is also a known carcinogen that can cause reproductive and developmental problems. In fact, e-waste represents 2 percent of America's trash in landfills, but it equals 70 percent of overall toxic waste.

In addition to that, in order to obtain the above mentioned precious materials, e-waste towns often resort to improper, unapproved methods of 'recycling' that often leave dangerous chemicals exposed to the environment and the people, thus causing diseases and impacting the wider community.

Major stakeholders

(1) Guiyu, China

Nicknamed as the “electronic graveyard,” Guiyu, in the Guangdong province of China is known as the largest e-waste dumping site in the world. In 2005, some 60,000 workers processed more than 100 truckloads worth of e-waste. 80% of the world’s electronic toxic waste ends up in Guiyu, with most of this waste coming from developed countries, such as Hong Kong (approximately 90% of Hong Kong’s computers) and the United States of America, where 60% of the waste originates from.

Other than being a dumping ground, the e-waste is also recycled in Guiyu. However, unsafe, unsanitary methods are used to achieve this. According to China's Shantou University, the town has the highest level of cancer-causing dioxins in the world and 88% of the children suffer from lead poisoning. In fact, the amount of lead present in the blood of these children is, on average, 54% higher than that of children from a nearby town, Chendian.

(2) Agbogbloshie, Ghana

It is a suburb of Accra, Ghana, and is well known as a destination for both legal and illegal exportation and dumping of electronic waste from other industrialised nations. The Ghanians living and working in Agbogbloshie face similar health problems as the residents of Guiyu, with high levels of toxins discovered in the soil and food samples, due to the chemicals staying within the food chain.

In addition to that, e-waste also poses a potential security threat. The hard disks that are transported to Agbogbloshie for recycling are often not wiped clean of their memories. As a result, private, personal information, such as account information, passwords and financial transaction history can be obtained by willing parties. Individuals in Ghana often scour the e-waste centres and exploit this information to carry out mostly local scams.

What has been done?

UN Involvement

Basel Convention

Also known as the 'Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal.' It was adopted in 1989 and enacted on 5th of May 1992, in order to tackle the issue of the improper management, disposal and transboundary movement of hazardous wastes. The Basel Convention covers hazardous wastes that are explosive, flammable, poisonous, infectious, corrosive, toxic, or ecotoxic.

The constituents of the Convention include restricting or in some cases, prohibiting the transboundary movement of hazardous wastes. In addition to that, it also dictates a certain set of regulations for the countries in managing the hazardous wastes, both internally and externally. For example, it puts the onus on countries to ensure that the production of hazardous wastes are reduced, proper disposal facilities are established and that the people involved in the disposal are also protected.

The Convention also declares illegal traffic in hazardous wastes as “criminal.” In addition to that, it also states that “Each Party shall take appropriate legal, administrative and other measures to implement and enforce the provisions of this Convention, including measures to prevent and punish conduct in contravention of the Convention.” However, the forms of “punishment” are not explicitly stated.

The European Union

EU: Waste Electrical and Electronic Equipment (WEEE) Directive

This directive became law in February 2003. The first priority of the directive is to discourage the waste of electrical and electronic devices, followed by the reusing, recycling and other ways of recovery of the abovementioned devices. In addition to that, one of its objectives is to improve the environmental performance of the various parties involved with such devices, such as the manufacturer, the distributor and the consumer.

A new amendment has been proposed in 2012 and is expected to become law in 2014. It now dictates that from 2016 onwards, the EU member states are required to collect 45 tonnes of e-waste for every 100 tonnes of electronic goods during the previous three years. In addition to that, retailers now have to recycle small electronic appliances when customers bring it to them, even if they do not buy a replacement. Similarly, with washing machines, manufacturers are expected to be responsible for the recycling. Such measures were put into place as only a third of the e-waste in Europe is recycled properly.

Individual countries

(1) Resource Conservation and Recovery Act of 1976 (RCRA), USA

This is the principal federal law governing the proper disposal of solid and hazardous waste. It gives the EPA, the United States Environmental Protection Agency, the legitimacy to establish a “cradle to grave” system governing electronics; from the moment it is produced to the moment it is discarded in order to reduce the amount of waste in the United States.

The regulated entities are subject to strict regulations and checks. In addition to that, they must first obtain a permit, either issued by the EPA or from a state agency where EPA has authorised. Despite the RCRA being a federal act, many of the states adopt and implement the RCRA programme.

(2) eDay, New Zealand

First held in Wellington in 2006, eDay is a yearly initiative to raise awareness of the potential dangers of e-waste, and to offer ways to safely and responsibly dispose of electronic appliances. On the day itself, dive-thru collection points are established and volunteers are deployed at points throughout the country. The public, from schools to office workers are encouraged to dispose of their old appliances through this method. This was initiated by CANZ (Computer Access New Zealand) as they felt that the landfills in New Zealand were running out of space and of the various health risks posed by improper disposal of e-waste.

(3) Law for the Recycling of Specified Kinds of Home Appliances (LRHA), Japan

This is the second law implemented in Japan with regards to electronic waste management. Enacted on April 1st 2009, it places more emphasis and responsibility on the consumer and the manufacturer. The law was further amended in 2008, this time adding on liquid-crystal / plasma television sets as well as clothing dryers to be recycled as well. The law was amended in response to a review by an assessment of the law five years after its implementation.

What can be done?

Possible Solutions

- Impose a tax on countries that abuse e-waste

- Tighter regulations for e-waste importing / exporting, with stricter punishments for countries that do not meet said regulations
- Provide economic aid to countries that are currently e-waste hubs in order for them to change their recycling practices to safer, less toxic methods or for them to change the focus of their main source of income altogether
- Impose safer health regulations, such that the practices that are carried out are sanctioned by the UN on the various e-waste hubs, with measures to reduce the ecological and health impact of improper disposal

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